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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/626,834	07/21/2003	Jean-Marc Karl Edgard Maurice Virgin	HOE-767	9246
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Lipsitz & McAllister, LLC 755 MAIN STREET MONROE, CT 06468			EXAMINER THOMAS, LUCY M	
			ART UNIT 2836	PAPER NUMBER

DATE MAILED: 07/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/626,834	<b>Applicant(s)</b> VIRGIN ET AL.	
	<b>Examiner</b> Lucy Thomas	<b>Art Unit</b> 2836	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 4/17/2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 40-80 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 40-80 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date: _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date: _____  | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 40-44, 46-47, 49-51, 53-62, 67-71, 73-76, and 79 are rejected under 35 U.S.C. 102(b) as being anticipated by Saito et al. (US 6,243,018). Regarding Claim 40, Saito discloses a line arrangement 1 for electrical systems of vehicles (Figure 1, Column 1, lines 10-12), comprising: an electrical supply line running from a current feed terminal to a current delivery terminal and having at least one current-carrying inner conductor (see conductors inside 3, 4, 5, Column 5, lines 59-61) and at least one protective sheath (see outer part of 3, 4, 5, Column 5, lines 46-47) surrounding the inner conductor, a detector element 2 which runs along the supply line, the detector element having at least one of an optical property and an electrical property, changes of the at least one of an optical and electrical properties being detectable by detecting means, the detector element being adapted in such a way that at least one of the electrical and optical properties are irreversibly changed when a short circuit originating from the current-carrying inner conductor occurs, and an isolating circuit (see 31, 32, 34 in Figure 11) responsive to detecting means and connected to the current feed terminal, the isolating circuit isolating the current-carrying inner conductor from a current source when a change of the at least one of the electrical and optical properties of the detector

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element is detected by the detecting means (Column 1, lines 28-38, Column 2, lines 1-6, 47-56, Column 3, lines 22-23, 38-45). Saito discloses that the short circuit originating from the current carrying inner conductor (in the event of a short-circuit, and arc will occur) and discloses that serious accidents such as a fire in the vehicle may break out in the worst case, and the heat generated from arc or fire leads to irreversible change of properties of the detector element, including one of an electrical property and an optical property, and therefore meet the claim limitations.

Regarding Claim 41, Saito discloses the line arrangement, wherein the detector element is formed in such a way that it irreversibly deteriorates in its electrical and/or optical property under the local effect of heat (Column 1, lines 28-35, 50-53, Column 3, lines 38-45).

Regarding Claim 42, Saito discloses the line arrangement, wherein the detector element surrounds the supply line (see Figure 1). Regarding Claim 43, Saito discloses the line arrangement, wherein the detector element comprises at least one electrical and/or optical detector line, the electrical and/or optical property of which is irreversibly changed when the short circuit occurs (Column 1, lines 28-35, 50-53, Column 3, lines 38-45). Regarding Claim 44, Saito discloses the detector line runs in the form of a helix (see Figure 19a).

Regarding Claim 46, Saito discloses the line arrangement, wherein portions of the detector line following one another in a longitudinal direction of the supply line and running transversely in relation to the longitudinal direction of the supply line are spaced apart from one another by a spacing which is less than approximately the diameter of

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the inner conductor (see Figures 19a, 19b). Regarding Claim 47, Saito discloses the line arrangement, wherein the detector line consists of a material which irreversibly changes in its electrical and/or optical property when there is local ingress of an amount of heat that can be generated by the arc (Column 1, lines 28-35, 50-53, Column 3, lines 38-45).

Regarding Claim 49, Saito discloses the line arrangement, wherein the detector line is surrounded by an insulating protective enclosure 6 (Column 3, lines 39-41).

Regarding Claim 50, Saito discloses the line arrangement, wherein the detector element has a carrier on which the detector line is held (see 12 in Figures 3, 4, Column 4, lines 50-54, Column 6, lines 23-27). Regarding Claim 51, Saito discloses the line arrangement, wherein the detector line is disposed in the form of conducting tracks on the carrier (see Figure 4). Regarding Claim 53, Saito discloses the line arrangement, wherein the carrier is given the form of a carrier strip (see 12 in Figure 3). Regarding Claim 54, Saito discloses the line arrangement, wherein the carrier strip runs helically around the supply line (see Figures 4, 5b).

Regarding Claim 55, Saito discloses the line arrangement, wherein the carrier surrounds the supply line at least partially (see Figures 4, 5b). Regarding Claim 56, Saito discloses the line arrangement, wherein the carrier encloses the supply line substantially completely (see Figures 4, 5b). Regarding Claim 57, Saito discloses the line arrangement, wherein the carrier (made of flexible insulating member) forms part of a protective enclosure for the detector line (Column 6, lines 23-25).

Regarding Claim 58, Saito discloses the line arrangement, wherein the carrier consists of a material, which irreversibly changes under the effect of the arc originating from the inner conductor (Column 1, lines 28-35, 50-53).

Regarding Claim 59, Saito discloses a line arrangement 1 for electrical system of vehicles (Figure 1, Column 1, lines 10-12), an electrical supply line running from a current feed terminal to a current delivery terminal and having at least one current-carrying inner conductor (see conductors inside 3, 4, 5, Column 5, lines 59-61) and at least one protective sheath (see outer part of 3, 4, 5, Column 5, lines 46-47) surrounding the inner conductor, a detector element 2 which runs along the supply line, said detector element comprising a carrier and a detector lines (Column 1, lines 59-64) said detector line having at least one of an optical property and an electrical property changes of said at least one of the optical and electrical properties being detectable by detecting means, the carrier being connected to the detector line and consisting of a material which under the local effect of an arc originating from the inner conductor irreversibly deforms and thus changes said at least one of said optical and electrical properties of said detector line due to the connection of said detector line to said carrier, and an isolating circuit (see 31, 32, 34 in Figure 11) responsive to the detecting means and connected to the current feed terminal, said isolating circuit isolating the current-carrying inner conductor from a current source when a change of the at least one of the electrical and optical properties of the detector line is detected by the detecting means (Column 1, lines 28-38, Column 2, lines 1-6, 47-56, Column 3, lines 22-23, 38-453 ). Saito discloses that the short circuit originating from the current carrying inner

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conductor (in the event of a short-circuit, and arc will occur) and discloses that serious accidents such as a fire in the vehicle may break out in the worst case, and the heat generated from arc or fire leads to irreversible change of properties of the detector element, including one of an electrical property and an optical property, and therefore meet the claim limitations. Claim 60 recites basically the elements of Claim 59, except for the recitation of decomposes instead of deforms in Claim 59 with regard to the carrier. Therefore, please see the rejection for Claim 59 above.

Regarding Claim 61, Saito discloses the line arrangement, wherein on account of its irreversible change under the local effect of the arc, the carrier irreversibly changes the electrical and/or optical property of the detector line (Column 1, lines 28-35, 50-53, Column 3, lines 38-45). Regarding Claim 62, Saito discloses the line arrangement, wherein the carrier locally interrupts the detector line (Column 3, lines 38-45).

Regarding Claim 67, Saito discloses the line arrangement, wherein the detector line lies in a circuit specific to the detector line (see Figure 2). Regarding Claim 68, Saito discloses the line arrangement, wherein at least one detector circuit is provided which activates the isolating circuit (see lower portion of Figure 11). Regarding Claim 69, Saito discloses the line arrangement, wherein the detector circuit is associated with the current feed terminal (see Figure 11). Regarding Claim 70, Saito discloses the line arrangement, wherein the detector circuit is associated with the current delivery terminal (see controller connected to terminal 42 in Figure 13). Regarding Claim 71, Saito discloses the line arrangement, wherein the detector circuit communicates with the isolating circuit by means of an electrical line (see electrical line in Figure 11).

Regarding Claim 73, Saito discloses the line arrangement, wherein a number of detector circuits (see 51-54 in Figure 14) are provided, and the detector circuits communicate with one another sense a change the electrical and/or optical behavior of the detector element. Regarding Claim 74, Saito discloses the line arrangement, wherein the detector circuits communicate with one another via an internal line within the line strand (see Figure 13 and communication lines from 46, 45 to 48). Regarding Claim 75, Saito discloses the line arrangement, wherein the detector circuits communicate with one another via an external line outside the line strand (see external communication lines 119-122 in Figure 15). Regarding Claim 76, Saito discloses the line arrangement, wherein the detector circuits communicate with one another via an electrical line (see connection in Figure 14).

Regarding Claim 79, Saito discloses a line arrangement 1 for electrical systems of vehicles (Figure 1, Column 1, lines 10-12), comprising: an electrical supply line running from a current feed terminal to a current delivery terminal and having at least one current-carrying inner conductor (see conductors inside 3, 4, 5, Column 5, lines 59-61) and at least one protective sheath (see outer part of 3, 4, 5, Column 5, lines 46-47) surrounding the inner conductor, a detector element 2 which runs along the supply line, the detector element comprising a detector line, said detector line having at least an electrical property, changes of the electrical property being detectable by detecting means, the detector element being adapted in such a way that the electrical property is irreversibly changed due to at least one of: (a) melting and fusing; and (b) thermal degradation of the material, when a local arc originating from the current-carrying inner



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conductor occurs, and an isolating circuit (see 31, 32, 34 in Figure 11) responsive to detecting means and connected to the current feed terminal, the isolating circuit isolating the current-carrying inner conductor from a current source when a change of the electrical property of the detector element is detected by the detecting means (Column 1, lines 28-38, Column 2, lines 1-6, 47-56, Column 3, lines 22-23, 38-45).

Saito discloses that the short circuit originating from the current carrying inner conductor (in the event of a short-circuit, melting, fusing and arc will occur) and discloses that serious accidents such as a fire in the vehicle may break out in the worst case, and the heat generated from arc or fire leads to irreversible change of the electrical property of the detector element.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

4. Claims 40-43, 67-69, and 78 are rejected under 35 U.S.C. 102(a) as being anticipated by Maeckel (WO 03/007450). Regarding Claim 40, Maeckel discloses a line arrangement 2 for electrical systems of vehicles (Abstract), comprising: an electrical supply line 6 running from a current feed terminal to a current delivery terminal and having at least one current-carrying inner conductor and at least one protective sheath 4 surrounding the inner conductor, a detector element 18 which runs along the supply line

and is formed in such a way that its electrical and/or optical behavior is irreversibly changed when an arc originating from the current-carrying inner conductor occurs, and an isolating circuit 12 connected to the current feed terminal to isolate the current-carrying inner conductor from a current source when the electrical and/or optical behavior of the detector element changes.

Regarding Claim 41, Maeckel discloses the line arrangement, wherein the detector element is formed in such a way that it irreversibly deteriorates in its electrical and/or optical behavior under the local effect of heat (Abstract).

Regarding Claim 42, Maeckel discloses the line arrangement, wherein the detector element surrounds the supply line (see Figure 3d). Regarding Claim 43, Maeckel discloses the line arrangement, wherein the detector element comprises at least one electrical and/or optical detector line, the electrical and/or optical behavior of which is irreversibly changed when the arc occurs (see Figure 3d).

Regarding Claim 67, Maeckel discloses the line arrangement, wherein the detector line lies in a circuit specific the detector line (see Figures 1, 2). Regarding Claim 68, Maeckel discloses the line arrangement, wherein at least one detector circuit 26 is provided which activates the isolating circuit. Regarding Claim 69, Maeckel discloses the line arrangement, wherein the detector circuit is associated with the current feed terminal (see connection of 26 in Figure 2). Regarding Claim 78, Maeckel discloses the line arrangement, wherein the detector circuit detects the occurrence of a potential in the detector line other than that of the detector line (see 22, 24 in Figure 2).

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 52 is rejected under 35 U.S.C. 103(a) as being unpatentable over Saito et al. (US 6,243,018) in view of Pope et al. (US 5,541,803). Regarding Claim 52, Saito does not disclose that the conducting tracks run in the manner of meanders on the carrier. Pope discloses a line arrangement (see Figure 6) for electrical systems, comprising an electrical supply line 61 running from a current feed terminal to a current delivery terminal and having at least one current-carrying inner conductor 63 and at least one protective sheath 62 surrounding the inner conductor, an isolating circuit (see Figure 2), and a detector element 60, wherein the detector line run in the form of a meanders. It would be obvious to those skilled in the art at the time to modify Saito's line arrangement and provide a conducting tracks run in the form of a meanders as taught by Pope, to provide improved coverage of the inner conductor and to facilitate easy handling.

7. Claims 45 and 63-66 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maeckel (WO 03/007450) in view of Pope et al. (US 5,541,803). Regarding Claim 45, Maeckel does not disclose a detector line run in the form of a meanders. Pope discloses a line arrangement (see Figure 6) for electrical systems, comprising an electrical supply line 61 running from a current feed terminal to a current delivery

terminal and having at least one current-carrying inner conductor 63 and at least one protective sheath 62 surrounding the inner conductor, an isolating circuit (see Figure 2), and a detector element 60, wherein the detector line run in the form of a meanders. It would be obvious to those skilled in the art at the time to modify Maeckel's line arrangement and provide a detector line in the form of a meanders as taught by Pope, to provide improved coverage of the inner conductor and to facilitate easy handling.

Regarding Claim 63, Pope discloses the line arrangement, wherein the detector element irreversibly changes its electrical and/or optical property when it is mechanically damaged (Column 4, 22-32). Claim 64 recites that the detector element changes in its electrical and/or optical property when undergoes mechanical damage caused by a mechanical component at a potential other than that of the detector line. Pope's detection element is suitable for mechanical damage of any kind.

Regarding Claim 65, Pope discloses the line arrangement, wherein the detector line irreversibly changes in its electrical and/or optical property when the detector element undergoes mechanical damage. Regarding Claim 66, Pope discloses the line arrangement, wherein the detector line irreversibly deteriorates in its property with regard to the passing through of electrical and/or optical signals when it undergoes mechanical damage.

8. Claim 48 is rejected under 35 U.S.C. 103(a) as being unpatentable over Saito et al. (US 6,243,018) in view of McCarthy et al. (US 3,956,726). Regarding Claim 48, Saito discloses the line arrangement, wherein the detector line consists of an insulating material, which irreversibly changes in its electrical and/or optical property from a

threshold temperature (Column 1, lines 28-35, 50-53, Column 3, lines 38-45). Saito does not specify the threshold temperature (melting temperature of the insulator) lies in the range from approximately 100°C to approximately 500°C. McCarthy discloses a heat detecting conductor and circuit arrangement comprising an insulating material whose melting point is in the range of approximately 200°C to 500°C (Abstract, Claim 1). It would have been obvious to those skilled in the art at the time the invention was made to modify the line arrangement of Saito to provide a detector line with an insulating material of melting point as taught by McCarthy to meet the requirements of the system (to provide sufficient flow and reliable coupling and contact).

9. Claims 72, 77 and 80 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saito et al. (US 6,243,018) in view of Born et al. (US 6,625,880). Regarding Claim 77, Saito does not disclose an optical line (a fiber optic cable). Born discloses a line arrangement for protection of electrical systems (Figures 1-5), wherein the detector circuits 110 communicate with one another via an optical line 100 (Column 1, lines 11-13, 63-67, Column 3, lines 1-35). It would be obvious to those skilled in the art at the time the invention was made to provide an optical line as taught by Born, because optical line provide protection of the system by detecting light and is preferred technology due to its speed, small size, and light weight.

Regarding Claim 72, Saito does not disclose a light guide (fiber optic cable) for communication between the detector circuit and the isolating circuit. It would be obvious to those skilled in the art at the time the invention was made to provide an optical guide or fiber optic cable for communication between two circuits as taught by

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Born, because fiber optic cable is a communication means which is faster, smaller and light weight.

Regarding Claim 80, Saito discloses a line arrangement 1 for electrical systems of vehicles (Figure 1, Column 1, lines 10-12), comprising: an electrical supply line running from a current feed terminal to a current delivery terminal and having at least one current-carrying inner conductor (see conductors inside 3, 4, 5, Column 5, lines 59-61) and at least one protective sheath (see outer part of 3, 4, 5, Column 5, lines 46-47) surrounding the inner conductor, a detector element 2 which runs along the supply line, the detector element comprising a detector line, said detector line having at least a property, changes of the property being detectable by detecting means, the detector element being adapted in such a way that the property is irreversibly changed when a local arc originating from the current-carrying inner conductor occurs, and an isolating circuit (see 31, 32, 34 in Figure 11) responsive to detecting means and connected to the current feed terminal, the isolating circuit isolating the current-carrying inner conductor from a current source when a change of the property of the detector element is detected by the detecting means (Column 1, lines 28-38, Column 2, lines 1-6, 47-56, Column 3, lines 22-23, 38-45). Saito does not disclose the property as optical. Born discloses a line arrangement for protection of electrical systems (Figures 1-5), wherein the detector circuits 110 communicate with one another via an optical line 100 (optical line having at least an optical property, Column 1, lines 11-13, 63-67, Column 3, lines 1-35). It would be obvious to those skilled in the art at the time the invention was made to provide an optical line as taught by Born, because optical line provide protection of the

system by detecting light and is preferred technology due to its speed, small size, and light weight.

### ***Response to Arguments***

10. Applicant's arguments filed 4/17/2006 have been fully considered.

The Applicant states that according to Saito, there does not need to be any change in the electrical property of the detecting line if a short circuit of one of the supply lines or ground occurs because the detecting line maintains its integrity and its electrical resistance unchanged. Saito discloses a detector element made of a detector line (electric conductivity layer) and an insulating material, and that when the insulating layer is broken and reaches the conductivity layer, the electric potential of the electric conductivity layer changes (change in electric potential is due to change in electric property - resistance, Column 3, lines 41-45), therefore, the reference meets the claim limitations.

Rejections under 35 U.S.C. 102(e), anticipated by Maeckel (US 2005/0128661) are withdrawn.

### ***Conclusion***

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US 3,588,689 Crawford discloses a line arrangement comprising a detector element which runs along the supply line, made of strip conductors covered with a insulative thermoplastic envelope, to detect faults in a cable system by measuring electrical properties such as resistance or capacitance to locate faults.


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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lucy Thomas whose telephone number is 571-272-6002. The examiner can normally be reached on Monday - Friday 8:00 AM - 4:30 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Sircus can be reached on 571-272-2800 x36. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

LT  
July 2, 2006

  
**BURTON S. MULLINS**  
**PRIMARY EXAMINER**